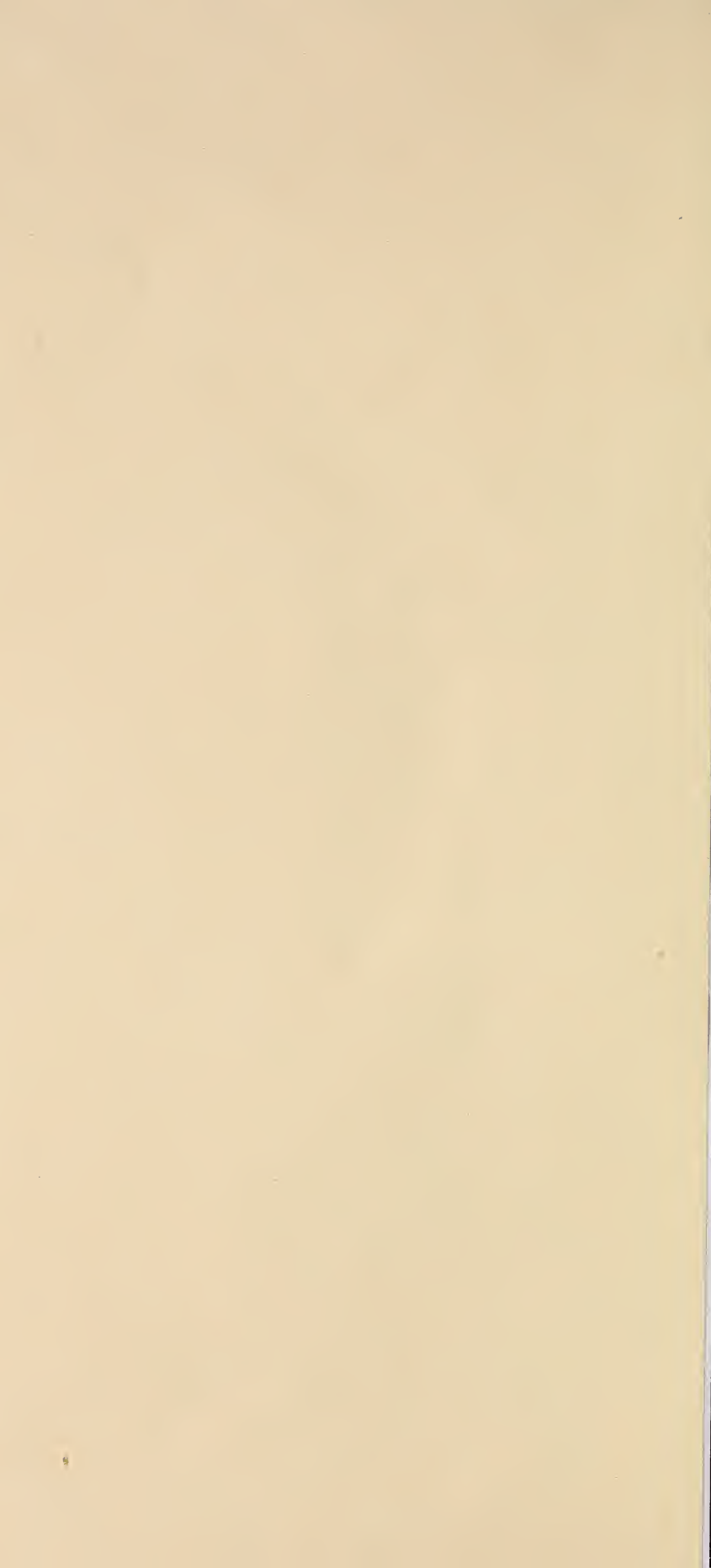


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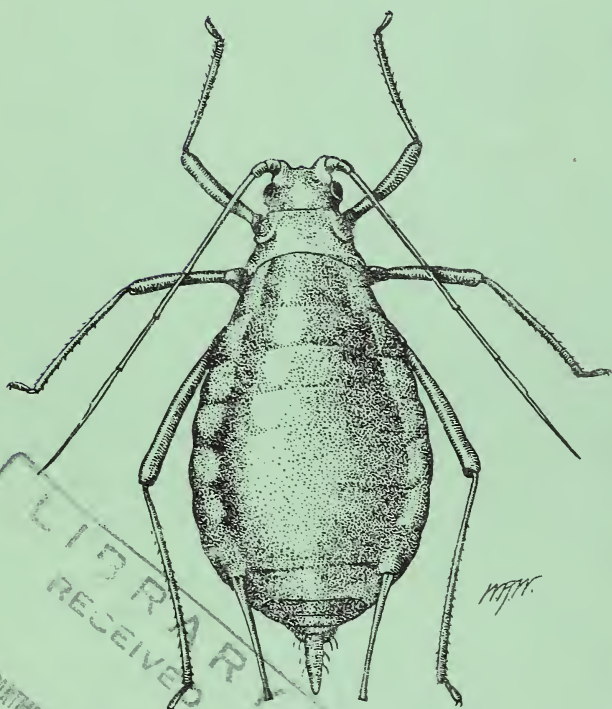
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# CONTROL of the PEA APHID in the East



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JULY 1951

THE PEA APHID is a very destructive pest of garden peas wherever they are grown in the United States. It sucks the sap from the leaves, stems, blossoms, and pods. The feeding of a few aphids may kill small pea plants and stunt larger ones so that the yield of peas is reduced. In heavy infestations the plants in entire fields may die before they produce any pods.

To control the pea aphid it is necessary to apply insecticides to large acreages of peas each year. In 1949 about 77,000 acres of peas in Wisconsin alone were treated with insecticides for control of this pest, at an estimated cost of \$480,000.

Experiments have shown that the control methods most effective in one section of the country are not always the best in another section. This leaflet gives information on the use of insecticides on peas grown for canning in the eastern part of the United States.

### Appearance and Habits

The pea aphid is a light-green soft-bodied insect. The adults are about  $\frac{3}{16}$  inch long and  $\frac{1}{16}$  inch wide. The young aphids, or nymphs, are similar in appearance but smaller. When food and weather conditions are favorable, most of the aphids are wingless. However, as conditions become unfavorable on the plants on which they develop, winged forms are produced, which may

fly away in search of other plants on which to feed. Although the pea aphid prefers peas, it may infest and injure alfalfa and several kinds of clovers.

### Insecticides Effective Against the Pea Aphid

DDT, parathion, TEPP (tetraethyl pyrophosphate), and rotenone will control the pea aphid when used as recommended. These insecticides may be applied as dusts and as sprays, both concentrated and dilute. Dusts can usually be obtained ready mixed. Wettable powders and emulsifiable concentrates, to be diluted with water for application as sprays, are usually available from local dealers or from processors or distributors. The percentage of active ingredient in these insecticides varies in different brands.

For each insecticide directions are given for preparing sprays from the products most likely to be available from your dealer. The label on the container will tell you what kind of formulation it is and how much of the insecticidal chemical it contains. If the percentage is different from that given, calculate the appropriate amount to use.

If you cannot obtain these insecticides locally, or you wish any further information about them, contact your county agricultural agent, your State agricultural experiment station or college, or the United States Department of Agriculture.

Before using any of these insecticides, read the precautions on page 9.



## DDT

A dust containing 5 percent of DDT is effective against the pea aphid. A 2- or 3-percent DDT dust containing 2 percent of a nonvolatile oil such as methylated naphthalene is equally effective.

DDT sprays should be prepared from emulsion concentrates, as wettable-powder sprays are much less effective. Add 2 quarts of a 25-percent emulsifiable concentrate to 10 gallons of water to prepare a concentrated spray and to 125 gallons of water for a dilute spray.

## Parathion

This is a very poisonous material, but very effective against the pea aphid. If it is applied at least 2 weeks before harvest, there is little danger from poisonous residues.

Use a ready-made dust containing 1 percent of parathion or a spray prepared from a wettable powder. Add 1 pound of a 25-percent wettable powder to 10 gallons of water for a concentrated spray or to 125 gallons for a dilute spray.

## TEPP

This is another extremely poisonous material, but it decomposes more rapidly than does parathion. Therefore, it presents no problem of poisonous residues and can be used on peas nearly ready for harvest. A dust should contain 0.75 percent of TEPP, and should be freshly mixed.

To prepare a TEPP spray use 1 pint of a 40-percent emulsifiable concentrate or its equivalent in 10 gallons of water for a concentrated spray or in 125 gallons for a dilute spray.

### Rotenone

Insecticides containing rotenone act more slowly and are not quite so effective as those described above, but will give fairly good results if properly applied. Dusts should contain at least 1 percent of rotenone, preferably with 1 to 2 percent of light mineral oil. Sprays can be prepared from proprietary mixtures containing rotenone or from derris or cube powder if a wetting agent is added. Follow the manufacturer's directions if using a proprietary product. For a home-made spray use 3 pounds of a powder containing 4 percent of rotenone, or its equivalent if of different strength, in 125 gallons of water.

### How to Apply Insecticides

Dusts and concentrated sprays may be applied with ground equipment or by means of aircraft. Dilute sprays should be applied only with ground equipment. The best method to use will depend somewhat on the equipment on hand, as well as on several other factors.

Ground equipment can be used efficiently in small fields or in fields bordered by high trees and other obstructions that would impede aircraft operation. It can also be used when the wind

is too high for airplane applications, and at night when there is usually the least wind. Ground dusters or sprayers can be driven as slowly as necessary--about 3 miles per hour--to cover the pea plants thoroughly with the insecticide.

Aircraft can be used to treat large acreages of peas within a few hours--a vital necessity when an infestation is building up rapidly. It can be employed when the soil is wet, and without injury to the crop when the peas are well along toward harvest. Aircraft applications are not efficient, however, when the wind is above 4 miles an hour, and even then dusts drift badly.

### Ground dusting

Apply a dust with a power duster capable of providing sufficient air velocity to produce a fine dust cloud and drive it well among the plants. The machine should feed the dust into the blower at a uniform rate and distribute it evenly through the entire length of the boom. Use 35 to 40 pounds per acre. Adjust the nozzles far enough above the plants so that the dust cloud will completely cover them. By enclosing the boom with a hood and attaching a canvas apron 25 or more feet long, it is possible to use the duster in winds up to 12 miles an hour. Do not use the hood or apron if the vines are wet, as it might injure the foliage.

### Ground spraying

Apply dilute sprays at about 125 gallons per acre. Use a conventional high-pressure sprayer that operates at





a pressure of 300 pounds per square inch. Adjust the boom so as to distribute the spray uniformly over the tops of the plants. It is important to strain the spray water and to examine the nozzles frequently to see that all are operating properly. A tank wagon or truck should be provided for hauling water to the sprayer.

Apply concentrated sprays at 10 gallons per acre. Their use avoids the handling of large quantities of water, but because they contain higher percentages of the insecticidal chemical they are more likely to injure the foliage than are dilute sprays. A mist-blower type of sprayer has been developed which breaks up the spray material into a fine mist and distributes it uniformly over the plants. In using a mist blower, be sure to apply the exact dosage specified, as a variation of 2 or 3 gallons per acre may give inferior control of the pea aphid or injure the plants.

### Aircraft applications

Applications of sprays and dusts by aircraft are best made by companies specializing in such work. Dosages of the insecticidal chemical should be slightly higher than for treatments with ground equipment. Either a larger quantity of a dust of the same strength or a stronger dust may be used, but the dosage of sprays can best be increased by using a more concentrated mixture.

Small planes should fly with the wheels from 3 to 5 feet and larger planes from 5 to 8 feet above the tops

of the plants. The swath width should not exceed the wing spread of the plane.

Smooth, level landing fields should be provided, which are large enough for the type of plane being used and readily accessible to all the pea fields to be treated.

A map of all the fields to be treated in any locality should be prepared.

### When to Apply an Insecticide

Begin to treat the pea fields with an insecticide before the aphids are abundant enough to injure the plants. Examine the plants frequently. A convenient method is to make single sweeps with a net in five representative parts of the field and count the aphids collected. Use an insect-collecting net 12 to 15 inches in diameter with a handle 2 to 3 feet long. When you get an average of about 35 aphids per sweep of this net, it is time to apply an insecticide. On plants too small to be swept one aphid per plant is sufficient. An infestation of this degree can cause serious damage to a crop within a week or 10 days if control measures are delayed.

Examine treated fields frequently, and if necessary make a second application.

Some varieties of peas develop clamshell-like buds, and the aphids feeding within these buds are not easily reached with insecticides. Such varieties should therefore be sprayed before the plants begin to bloom.

## PRECAUTIONS

**INSECTICIDES ARE POISONS. USE THEM CAUTIOUSLY.** Store them in plainly labeled containers. Avoid continuous exposure to oil solutions or emulsions. Do not use sprays containing oil near fires, and do not smoke near mixing and storage tanks.

**DDT LEAVES A POISONOUS RESIDUE ON THE FOLIAGE.** Do not feed pea ensilage treated with DDT to milch animals or to animals being finished for slaughter.

**PARATHION AND TETRAETHYL PYROPHOSPHATE ARE EXTREMELY DANGEROUS POISONS. THEY SHOULD BE USED ONLY BY TRAINED OPERATORS WHO WILL ASSUME FULL RESPONSIBILITY AND ENFORCE PROPER PRECAUTIONS AS PRESCRIBED BY THE MANUFACTURERS.** Avoid getting any parathion or tetraethyl pyrophosphate on the skin, especially the concentrated material. Keep your shirt buttoned at the neck and your sleeves rolled down and buttoned at the wrist. Wear rubber-covered gloves, a protective head covering, and a cover-all, smock, or coat of rubberized cloth that can be washed after each wearing. After each application wash your hands and face thoroughly with soap and water. Wash off without delay any insecticide that is spilled on the skin.

To avoid breathing parathion or tetraethyl pyrophosphate, wear a tight-fitting full-face gas mask equipped with



a canister specified for use in handling organic vapors, acid gases, and dusts. Replace the canister with a new one after use.

Persons developing headache, nausea, impaired vision, or tightness of the chest when using parathion or tetraethyl pyrophosphate should go or be removed to fresh air immediately. Give an emetic, such as mustard or warm soapy water, immediately and call a doctor. Atropine sulfate is an antidote for parathion and tetraethyl pyrophosphate. Obtain it by prescription in 1/100-grain tablets and keep it on hand for use in an emergency. For severe poisoning take two tablets at once and call a physician immediately.

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